BULLETIN
of the
Chicago Herpetological Society

Volume 55, Number 1
January 2020

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Manuscripts published in the *Bulletin of the Chicago Herpetological Society* are not peer reviewed. Manuscripts and letters concerning editorial business should be e-mailed to the editor, mdloogatch@chicagoherp.org. Alternatively, they may be mailed to: Chicago Herpetological Society, Publications Secretary, 2430 N. Cannon Drive, Chicago, IL 60614. **Back issues** are limited but are available from the Publications Secretary for $2.50 per issue postpaid.

Visit the CHS home page at <http://www.chicagoherp.org>.

The *Bulletin of the Chicago Herpetological Society* (ISSN 0009-3564) is published monthly by the Chicago Herpetological Society, 2430 N. Cannon Drive, Chicago IL 60614. Periodicals postage paid at Chicago IL. **Postmaster:** Send address changes to: Chicago Herpetological Society, Membership Secretary, 2430 N. Cannon Drive, Chicago IL 60614.

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A Letter from the Outgoing CHS President

Rich Crowley

The past three years have been a personal challenge for me and in many ways, a challenging time for the Chicago Herpetological Society.

On reflection, my experiences over the last three years are indicative of a general theme I am seeing everywhere. Our lives are busier than ever and our time more precious as a result. We face numerous distractions in our daily lives from social media, disruptive technological changes, societal and political conflicts, our personal commitments and our pursuit of personal and professional goals.

For me personally, over the last three years I was challenged with a changing work environment, faced mid-life decisions, supported an aging and unwell parent, supported my daughter and granddaughter, needed to be supportive of my spouse's professional growth, managed an evolving and demanding herp collection, wrote a book, and of course . . . provided leadership for the CHS during some challenging times.

I bring up my personal challenges as they relate to my CHS presidency because all of our membership—general members and board members alike—have personal lives that force us to balance priorities. Nevertheless, as president together with the board of directors, committee chairs and dedicated volunteers that have served over the last three years, we have faced a number of challenges and successfully managed this organization.

Still, we need more engagement for the long-term, and for that I plead to everyone to be participants and not bystanders with the CHS activities going forward. In the last three years, we faced numerous challenges to the CHS and our hobby. We face challenges on our rights to own animals and share the herp experience at both the federal and state level. Thankfully, prominent representatives in the hobby including USARK and number of responsible members of the herp community continue to lead successful defenses to ill-informed legislative restrictions.

We also had to deal with our own legal challenges. These experiences reminded us of our duty of care to our members, our partners and to the public. We continue to face these challenges now and in the future. With these new challenges, we learned to respect our part in this space more. For example, we improved our exhibitor guidelines for not only Reptilefest, but for all our exhibiting activities. We also developed a formal incident response procedure that is shareable with other organizations.

Following these challenges, we faced our biggest challenge yet: the notification of non-renewal from our insurance carrier. Aside from spending several months and countless hours pursuing replacement coverage, we had to postpone exhibiting animals for several months. In the end, we were able to get new insurance, but we now face years of restoring trust and achieving again perfect no claims experience. Even with the disruption, our volunteers continue to exhibit every weekend toward the goal of a perfect safety record.

We now face challenges with succession in our committees, which benefited from long-tenured volunteers who deserve more recognition than we can give them. For example, Linda Malawy who for over 19 years chaired the adoptions program successfully. Over the last year, Linda stepped aside and now Zorina Banas continues the leadership to this important and highly visible program. Just think, we nearly discontinued this program only four years ago!

Another great story is that of ReptileFest with over 25 years of success! This event has been a success built on the efforts of many volunteers over the years. Over the last couple of years, we faced the challenge of transitioning event leadership and support from John Archer and Andy Sagan, and so many others. However, we saw the successful transition of the event leadership to Frank Sladek who added his own contributions to this nationally recognized event.

Our program of live-animal shows, our broadest outreach initiative, represents our first contact with new keepers, public and partner organizations, and continues to flourish despite the insurance disruption. We have seen this program continue, now under the leadership of Gail Oomens. Gail and her core group of volunteers (Mike Scott, Tom Mikosz, Nancy Kloskowski, Dick Buchholz, to name just a few) have managed to keep up with the growing volume of demands for the CHS presence along with the increasing standard of care in coordinating exhibition safety, requests for insurance certification, scheduling and donation collection. All performed on volunteered time!

The future of volunteer-run, not-for-profit organizations is still uncertain. Therefore, to increase our value, we need to stay relevant, be visible in a positive way and add value to the community. To address this, we have embarked on the initiative to standardize our online social presence thanks in large part to Kim Klisiak. Kim has done a fantastic job of updating three separate web locations: Junior Herpers, ReptileFest and CHS main site. Much work has been done and much still needed and though Kim moves off the board, we still see the momentum continuing on this strategic initiative for the society. We have presence on Facebook, Instagram, as well as our web pages and email connections. All these connections are virtually supported by our volunteers, committees and the board.

So let us not forget that an organization such as the CHS is run by its members. Our most critical and yet volatile resource. In today's society, we face challenges of not only recruiting new members, but also building a deep well of participating membership. By building membership breadth, we can spread the workload and allow greater diversity in thinking and creativity. When resources are limited, having depth in our membership can facilitate resources to draw on when needed. Every member has the opportunity to help us engage new members, get active in our society and help the board face the challenges we have yet to overcome.

Please support the board in 2020. Do not wait to be asked, please offer your assistance and offer ideas no matter how small. After all this is your organization; make the CHS a part of you.

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The Herpetofauna of Presque Isle State Park, Erie, Pennsylvania: Annotated Checklist and Comprehensive Bibliography

Brian S. Gray
Natural History Museum at the Tom Ridge Environmental Center
301 Peninsula Drive, Suite 3
Erie, PA 16505
brachystoma@hotmail.com

Abstract

Thirteen species of amphibians (9 frogs and 4 salamanders) and 18 species of reptiles (9 turtles and 9 snakes) have been reported to occur at Presque Isle State Park, Erie County, Pennsylvania. However, six of those species have not been observed on the peninsula in more than 60 years. The Northern Spring Salamander and the Wood Turtle likely never had established populations on Presque Isle, whereas the Pickerel Frog, Woodland Box Turtle, Hog-nosed Snake, and Eastern Milksnake were likely extirpated. One of the 25 extant species established at Presque Isle, the Red-eared Slider, is an introduced invasive species. Recommendations for surveying Presque Isle's herpetofauna are provided, especially for the rarer and possibly extirpated species (e. g., Eastern Milksnake, Hog-nosed Snake). A long-term monitoring program of Presque Isle's herpetofauna is needed to determine the current status of many of the peninsula's species, such as the Spotted Turtle and Blanding's Turtle. Such efforts could also be used to establish baseline data that could assist in detecting changes in species' population sizes and distributions. A comprehensive bibliography of Presque Isle herpetology is also presented.

Introduction

Presque Isle State Park is an approximately 1300-hectare compound recurved sand spit that protects Erie Harbor along the southern shore of Lake Erie in Erie County, Pennsylvania (Figure 1). The peninsula likely formed between 4000 and 5000 years ago as rising lake levels winnowed sand from the late Wisconsinan moraine that extends across the lake from Long Point, Ontario, Canada, toward Erie (Delano, 1999). Presque Isle contains a wide variety of beach, dune, wetland, and forest habitats that provide ideal environments for many species of wildlife, including amphibians and reptiles (Campbell et al., 1994; Delano, 1999).

The earliest mention of amphibians and reptiles from Presque Isle and vicinity date from 1795 to 1817 (Burges, 1795 [1965]; LeSueur, 1817). However, it was the collecting efforts of Carnegie Museum of Natural History (CM) field collector

Figure 1. Presque Isle State Park, Erie, Pennsylvania. Image courtesy of Google Earth 2018.

and naturalist Daniel A. Atkinson and botanist Otto E. Jennings during 1900–1906 that laid the foundation for the study of Presque Isle's herpetofauna. Atkinson documented 23 species of amphibians and reptiles (7 frogs, 3 salamanders, 7 turtles, and 7 snakes) from the peninsula, resulting in at least 185 catalog numbers assigned to specimens collected by Atkinson in CM (see Appendix). Other than studies focused primarily on the Red-spotted Newt during the 1930s (Hudson, 1930; Williams, 1931; Collins, 1932), there is a dearth of published papers regarding Presque Isle herpetology until Donald M. McKinstry's studies during 1971–1990 (McKinstry and Felege, 1974; McKinstry, 1975; McKinstry et al., 1987; McKinstry et al., 1991) and Roger McPherson (1982;1985). More recently, studies have ranged from short-term surveys (Hughes and Schnars, 2007b; Jones and Wilson, 2015), frog call surveys (Great Lakes Marsh Monitoring Program [GLMMP], Bird Studies Canada), to ecological studies of the peninsula's turtles (Lindeman, 2006; Patterson and Lindeman, 2006; Mahoney and Lindeman, 2016; Lindeman, 2018). Additionally, the Pennsylvania Fish and Boat Commission is monitoring the Blanding's Turtle on the peninsula, and Pennsylvania Sea Grant is removing invasive Red-eared Sliders from Presque Isle. The Regional Science Consortium is also monitoring frog calls. It has been nearly three decades since the last published summary of Presque Isle herpetology (McKinstry et al., 1991), and to date no comprehensive bibliography or list of museum holdings specific to the herpetology of Presque Isle State Park exists. Herein, I provide a summary of the current state of knowledge of the herpetology of Presque Isle, including a list of known museum specimens collected on the peninsula, and a comprehensive bibliography pertinent to the herpetology of Presque Isle.

Methods

I reviewed the published literature, as well as unpublished field notes and reports, iNaturalist observations, GLMMP occurrence data (via Global Biodiversity Information Facility, GBIF), and museum records for reports of Presque Isle amphibians and reptiles. Museum holdings were searched via the GBIF, Integrated Digitized Biocollections (iDigBio) and VertNet online databases. Additionally, the collection databases of Edinboro University of Pennsylvania (EUP) and the Natural History Museum at the Tom Ridge Environmental Center (TREC) were searched directly. Photographs are included to aid in the identification of each species. Effort was made to include images of specimens from Presque Isle. When this was not possible, specimens from mainland Erie County or elsewhere in Pennsylvania were used. Common and scientific names of amphibians and reptiles used herein follow Crother (2017).

Results

A search of occurrence data in the literature, direct searches of select institutions, and inquiries of the GBIF, iDigBio, and VertNet databases revealed that the following institutions contained herpetofaunal specimens collected from Presque Isle, Erie, Pennsylvania: CM = Carnegie Museum of Natural History, Pittsburgh, Pennsylvania; EUP = Edinboro University of Pennsylvania; FHSM = Fort Hays Sternberg Museum of Natural History, Hays, Kansas; MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; RM = Redpath Museum, McGill University, Montreal, Quebec; TREC = Natural History Museum at the Tom Ridge Environmental Center, Erie, Pennsylvania; USNM = United States National Museum, Washington, D. C.; YPM = Yale Peabody Museum of Natural History, New Haven, Connecticut.

Excluding lone individuals that were obvious released pets, there are 31 species of amphibians and reptiles that have been reported from Presque Isle, including nine frogs, four salamanders, ten turtles, and eight snakes. One turtle species established on the peninsula, the Red-eared Slider (*Trachemys scripta elegans*), is nonnative and considered invasive. Additionally, it has been suggested that the Short-headed Gartersnake may have been introduced onto the peninsula (Price, 1978; McKinstry et al. 1991). Six species have not been observed on Presque Isle for several decades and have likely been extirpated: the Eastern Hog-nosed Snake (60 years), Wood Turtle (86 years), Pickerel Frog (113 years), Northern Spring Salamander (113 years), Woodland Box Turtle (113 years), and Eastern Milksnake (113 years). Furthermore, since the late 1980s, drastic declines have been reported for three once relatively common species: Wood Frog, Spotted Salamander, and Red-spotted Newt. Whether or not these species still remain on Presque Isle is uncertain and warrants further investigation. Five species, Blanding's Turtle, Spotted Turtle, Queensnake, Short-headed Gartersnake, and Northern Ribbonsnake are rare on the peninsula and are also in need of surveys to determine their status on the park, and will require long-term monitoring to acquire the necessary data (i.e., population size and structure, survivorship, home range, etc.) needed for sound conservation and management decisions. Seventeen native species appear to be secure on Presque Isle.

The following accounts provide a summary of each species' documentation on Presque Isle, comments on current status, natural history, conservation and research needs. Not all information is provided for all species. For example, for those species that are abundant and widely distributed on the peninsula, only the first documentation and current status may be given. Generally, the rarer the species, the more information provided.

Frogs and toads

American Toad, *Anaxyrus americanus* (Figure 2). The American Toad was first documented on Presque Isle by Daniel Atkinson with a specimen (CM 2086) deposited in the Carnegie Museum of Natural History (CM) dated August 1900. The American Toad is common and widespread on the peninsula.

Fowler's Toad, *A. fowleri* (Figure 3). Fowler's Toad was first documented on Presque Isle in August 1900 by Daniel Atkinson, with specimens deposited in CM (CM 2084-2085; CM 2087). Steele et al. (2010) consider Fowler's Toad a Species of Greatest Conservation Need due to recent population declines in western Pennsylvania and uncertain status of eastern Pennsylvania populations. At Presque Isle, Fowler's Toad is abundant, but not as widely distributed as the American Toad. Breeding activity appears to be restricted to Gull Point and Thompson Bay (Lethaby, personal communication). On 1 April 1990, calling and breeding activity of Fowler's Toads on Presque Isle was featured in a segment of PBS's Nature series,

Figure 2. American Toad (male) calling. Presque Isle State Park. Photograph by Mark Lethaby.

Figure 3. Fowler's Toad. Presque Isle State Park. Photograph by Mark Lethaby.

Figure 4. Gray Treefrog. Presque Isle State Park. Photograph by Mark Lethaby.

Figure 5. American Bullfrog. Elk Creek, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 6. Green Frog. Asbury Woods, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 7. Pickerel Frog. Elk Creek, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 8. Northern Leopard Frog. Presque Isle State Park. Photograph by Mark Lethaby.

Figure 9. Wood Frog. Elk Creek, Erie County, Pennsylvania. Photograph by Brian S. Gray.

in the episode "Presque Isle: Land in Motion." Hybridization between Fowler's Toad and American Toad occurs on Long Point, Ontario (Green and Parent, 2003), but has not been reported from Presque Isle.

Gray Treefrog, *Hyla versicolor* (Figure 4). While it may have historically been present on the peninsula, the Gray Treefrog was first documented on Presque Isle by McPherson (1982). Subsequently, a specimen collected by D. McKinstry and H. Cunningham on 23 May 1989, and deposited in CM resulted in a county record for the species in Erie County (Hulse and Hulse, 1992). The Gray Treefrog is common on Presque Isle, and choruses can be heard calling in late spring and during the summer at numerous locations on the park, especially in the neck of the peninsula.

American Bullfrog, *Lithobates catesbeianus* (Figure 5). The American Bullfrog was first documented on Presque Isle sometime after 1950 (Lethaby, 2001). However, it is likely that this species was present on the peninsula long before this. Ortmann (1909) noted that American Bullfrogs were met with in numbers in northwest Pennsylvania in clear streams, ponds, and Lakes. McPherson (1982) regularly observed or heard American Bullfrogs in small lagoons on Gull Point. The first vouchered specimen (TREC A-00037) was collected by M. Lethaby on 26 May 2008, and deposited in the Natural History Museum at the Tom Ridge Environmental Center (TREC). King et al. (1997) noted that the American Bullfrog has been introduced on Middle Bass Island in the western end of Lake Erie. Whether or not this is the case on Presque Isle is not known.

Green Frog, *L. clamitans* (Figure 6). The Green Frog was first documented on Presque Isle by Daniel Atkinson with specimens (CM 1861-1870) deposited in the CM dated August 1900. The Green Frog is common and widespread on the peninsula.

Pickerel Frog, *L. palustris* (Figure 7). Two specimens (CM 1739; CM 1743) were collected at "Presque Isle" by Daniel Atkinson in August 1900 and 5 June 1906, respectively. There are no other documented records of the Pickerel Frog from Presque Isle despite several surveys (McPherson, 1982; McKinstry et al., 1991; Hughes and Schnars, 2007b; Jones and Wilson, 2015). Furthermore, a search of the GLMMP records on for Presque Isle during April 1996 through September 2018 (GBIF, 2019) did not contain any records of calling Pickerel Frogs. The Pickerel Frog is relatively common on the mainland, the nearest known locality being 2.6 km south of the Peninsula (Gray, 2007). Elsewhere in Erie County and on Long Point, Ontario, the Pickerel Frog and Northern Leopard Frog are sympatric (personal observation; Ontario Nature, 2019). The Pickerel Frog closely resembles the Northern Leopard Frog and can easily be mistaken for the latter species. Differentiating between the two species generally involves the following: the spots on the Leopard Frog are rounded, dark (usually black) with a light border; spots on the Pickerel Frog are squarish, brownish with a black border. In addition, the ground color of Leopard Frogs is usually green (but can be brownish), while the Pickerel Frog has a brownish ground color, with yellowish color on the inguinal region that is lacking in the Leopard Frog. Effort should be made to document the presence of the Pickerel Frog on the peninsula. It is likely that the Pickerel Frog may have been extirpated on Presque Isle.

Northern Leopard Frog, *L. pipiens* (Figure 8). The Northern Leopard Frog was first documented on Presque Isle by Daniel Atkinson with a specimen (CM 1740) deposited in CM and dated August 1900. Steele et al. (2010) consider the Northern Leopard Frog as a Pennsylvania Species of Greatest Conservation Need, citing the species has undergone a localized reduction in range and a considerable decline in abundance. On Presque Isle, the Northern Leopard Frog is one of the most common amphibians and appears secure.

Wood Frog, *L. sylvaticus* (Figure 9). A specimen (CM 1946) in the CM dated 5 June 1906 was collected at "Presque Isle" by Daniel Atkinson. McPherson (1982) noted that the Wood Frog was quite common on the bird sanctuary on Presque Isle. An image of a Wood Frog photographed on the peninsula during the late 1980s or early 1990s is found in Grubbs (2006). However, recent surveys have failed to observe any Wood Frogs on the peninsula (McKinstry et al., 1991; Hughes and Schnars, 2007b; Jones and Wilson, 2015). Furthermore, a search of the GLMMP records for Presque Isle during April 1996 through September 2018 (GBIF, 2019), did not contain any records of calling Wood Frogs. Surveys should be focused on searching for the Wood Frog where it has been observed in the past, such as on Gull Point. There are also vernal pools around Cranberry Pond (Figure 10) that could provide suitable habitat for this species. Surveys for calling males and searches for egg masses in early spring are recommended. Also, sampling for Wood Frog larvae with funnel traps in early summer may detect this species.

Spring Peeper, *Pseudacris crucifer* (Figure 11). The Spring Peeper was first documented on Presque Isle by Daniel Atkinson with a specimen (CM 2002) dated 5 June 1906. Another specimen (CM 1996) possibly collected earlier by Otto Jennings lacks date of collection. Other specimens collected by Jennings on Presque are from June 1906. The Spring Peeper is widely distributed on the peninsula, and choruses can be heard early in the spring, as verified by GLMMP data (GBIF, 2019).

Salamanders

Spotted Salamander, *Ambystoma maculatum* (Figure 12). The

Figure 10. Vernal pool proximate to Cranberry Pond, Presque Isle State Park. Photograph by Brian S. Gray.

Figure 11. Spring Peeper. Asbury Woods, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 13. Northern Spring Salamander. Warren County, Pennsylvania. Photograph by Brian S. Gray.

Figure 15. Eft stage of the Red-spotted Newt,. Asbury Woods, Erie County, Pennsylvania. Photograph by Brian S. Gray.

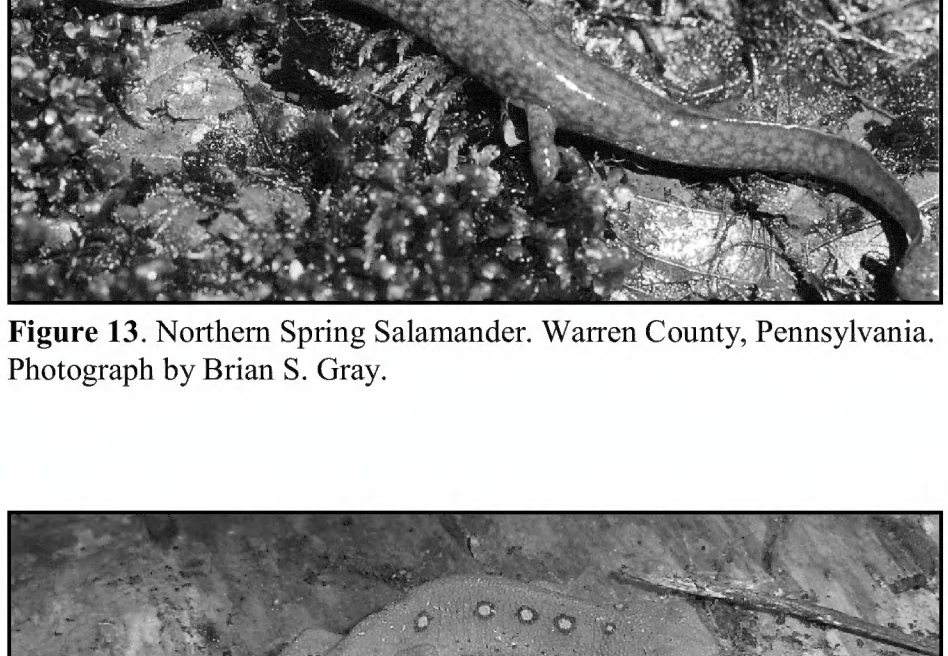

Figure 16. Eastern Spiny Softshell. Presque Isle State Park, Erie County. Photograph by Mark Lethaby.

Figure 12. Spotted Salamander. Route 832 Bridge, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 14. Common Mudpuppy. French Creek, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 17. Snapping Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

earliest record of the Spotted Salamander on Presque Isle consists of a specimen (CM 1698) in the CM collected by Daniel Atkinson during August 1900. The Spotted Salamander was observed by McKinstry (1975) under damp logs in hardwood forest with dense canopy, inland ponds, and shallow intermittent swamps (e.g., along Sidewalk Trail and Cranberry Pond area). The most recent documented report of Spotted Salamanders on Presque Isle is by McKinstry et al. (1991), who found them in deciduous forest WNW of the Marina. Ware (2006) mentions observing many salamanders in this general area, but failed to identify the species or the date. An apparent decline of the Spotted Salamander on Presque Isle has occurred, with no recent observations.

Northern Spring Salamander, *Gyrinophilus p. porphyriticus* (Figure 13). A Northern Spring Salamander specimen in the CM (CM 344) was presumably collected at "Presque Isle" by Daniel Atkinson 5 June 1906. There have been no further observations of Northern Spring Salamander on Presque Isle. These salamanders prefer cool, clear springs and streams that are free of predatory fishes (Bishop, 1943; Pfingsten, 2013), habitats that are lacking on Presque Isle. It is possible that the CM specimen was collected from one of the mainland streams emptying into Presque Isle Bay. A small stream, Head Run, flowing through the head of the peninsula may have supported Northern Spring Salamanders at the time of Atkinson's collecting. Furthermore, at the time Atkinson collected, it was commonplace to list collection localities in general terms. For example, a specimen collected on the mainland immediately south of Presque Isle Bay might be recorded as "Presque Isle." Incidentally, the French applied the name Presque Isle to the site of Erie, to the fort they built in 1753 (Fort Presque Isle), as well as the portage south to Fort Le Boeuf (Lechner, 1994).

Common Mudpuppy, *Necturus m. maculosus* (Figure 14). The Common Mudpuppy was first documented at Presque Isle in April 1956 by Frank Schwartz (CM 41285), and subsequently observed by McPherson (1982) and McKinstry et al. (1991). During June 2002, there was a significant die-off of Common Mudpuppies in Lake Erie (Bartlett, 2002) that was possibly caused by avian botulism or low oxygen levels in the lake (Wellington, 2009). Common Mudpuppies are frequently caught by fisherman on hook and line in the main channel of Presque Isle Bay. Monitoring of the Common Mudpuppy is advised in light of past die-offs.

Red-spotted Newt, *Notophthalmus v. viridescens* (Figure 15). The Red-spotted Newt was first documented at Presque Isle in August 1900 by Daniel Atkinson (CM 1636), and subsequently observed by McKinstry (1975) and McPherson (1982). Red-spotted Newts were once very abundant on Presque Isle (Hudson, 1930; Williams, 1931; Collins, 1932; McKinstry, 1975). McPherson (1982) noted that the Red-spotted Newt was the most abundant salamander during his survey. There has been an apparent decline in this species on Presque Isle. The species was not observed by McKinstry et al. (1991), although a specimen was photographed by Bob Grubbs on the peninsula in the late 1980s or early 1990s (Grubbs, 2006; Grubbs, 2019 personal communication). The Red-spotted Newt is common at other sites in Erie County (Gray and Lethaby, 2008). Surveys for the Red-spotted Newt should focus on areas where the species was previously observed (e.g., Gull Point, west of Thompson Bay, Cranberry Pond and Sidewalk Trail areas). Funnel traps in wetlands could be used to sample for larvae and aquatic adults; turning logs in the vicinity of ponds and pools in the above areas could reveal terrestrial efts. Interestingly, Hudson (1930) noted that Red-spotted Newts were found primarily on the north shores of Long Pond, Cranberry Pond, and Dead Pond.

Turtles

Eastern Spiny Softshell, *Apalone s. spinifera* (Figure 16). The Eastern Spiny Softshell was first documented at Presque Isle in August 1900 by Daniel Atkinson (CM 1321), and subsequently observed by McPherson (1982), McKinstry et al. (1987) and McKinstry et al. (1991). One of the least abundant turtles on the peninsula. Mahoney and Lindeman (2016) noted that the observed low recaptures of Eastern Spiny Softshells at Presque Isle might suggest that either their relative abundance is higher than trapping data indicate or that they are a mobile species with less habitat fidelity than other resident turtle species. They further noted that since Eastern Spiny Softshells represented only 4% of turtles caught in fyke-nets in Misery Bay, by far the most successful trapping method and trapping site for the species, they likely are relatively rare at Presque Isle rather than abundant (Mahoney and Lindeman, 2016).

Snapping Turtle, *Chelydra serpentina* (Figure 17). The Snapping Turtle was first documented at Presque Isle in August 1900 by Daniel Atkinson (CM 3193), and subsequently observed by McPherson (1982), McKinstry et al. (1987) and McKinstry et al. (1991). The Snapping Turtle was the second most abundant turtle observed on Presque Isle by Mahoney and Lindeman (2016).

Midland Painted Turtle, *Chrysemys picta marginata* (Figure 18). The Midland Painted Turtle was first documented at Presque Isle in August 1900 by Daniel Atkinson (CM 3009), and subsequently observed by McPherson (1982), McKinstry et al. (1987) and McKinstry et al. (1991). The Midland Painted Turtle is abundant on the peninsula, and was the fourth most captured species noted by Mahoney and Lindeman (2016).

Spotted Turtle, *Clemmys guttata* (Figure 19). The Spotted

Figure 18. Midland Painted Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 19. Spotted Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Lauren Kratzenberg.

Figure 21. Wood Turtle. Warren County, Pennsylvania. Photograph by Brian S. Gray.

Figure 23. Eastern Musk Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Brian S. Gray.

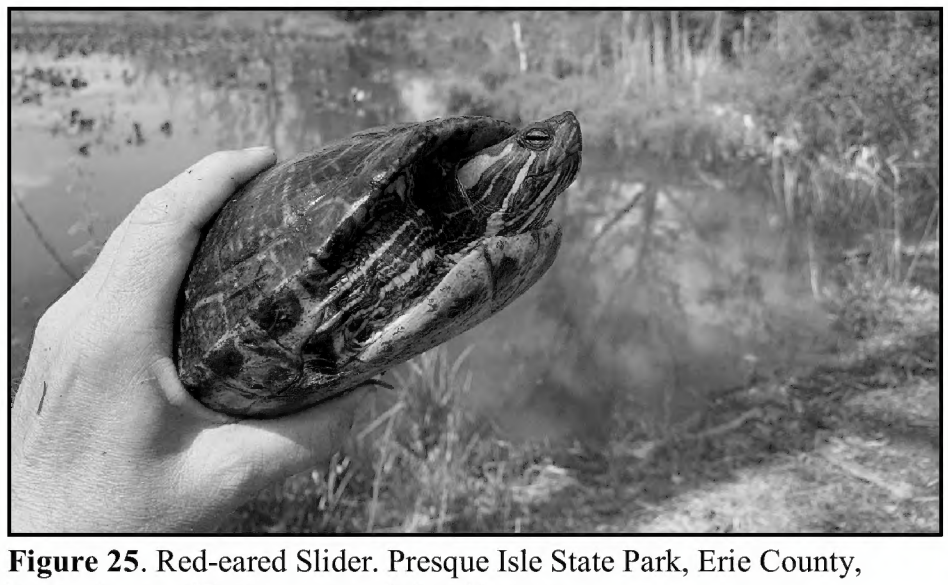

Figure 25. Red-eared Slider. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Figure 20. Blanding's Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 22. Northern Map Turtle. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Figure 24. Woodland Box Turtle. Franklin County, Pennsylvania. Photograph by Brian S. Gray.

Figure 26. Eastern Hog-nosed Snake. Photograph by Charlie Eichelberger.

Turtle is one of the least observed turtles at Presque Isle. The Spotted turtle was first documented on Presque Isle in August 1900 by Daniel Atkinson (CM 3204). A specimen in the CM (CM S7502) collected by S. H. Williams in 1934 from "Erie Harbor" may also have been from Presque Isle. More recently, a specimen was observed and photographed by Mark Lethaby 22 April 2008 (TREC R-104). Two additional individuals have since been documented. A nesting "spotless" female was observed on the peninsula on 14 June 2018 (iNaturalist, 2019). A male Spotted Turtle first observed 23 May 2019 along Fisher Drive (Kratzenberg, 2019 personal communication), was subsequently found dead on the road (DOR) 11 July 2019 (TREC R-153). The Spotted Turtle was selected as a Pennsylvania Species of Greatest Conservation Need because of its uncertain status and evidence of population declines (Steele et al., 2010). The status of the population at Presque Isle is undetermined at this time. McPherson (1982) noted that the Spotted Turtle is common in Erie County. This is not the case today, as two Erie County Spotted Turtle populations known by the author have been negatively impacted by habitat alteration. Spring surveys utilizing spotting scopes and funnel traps should be done in shallow wetlands proximate to where Spotted Turtles have been observed. Once their distribution on Presque Isle is known, further monitoring would be needed to determine the population's size, structure, and life-history traits.

Blanding's Turtle, *Emydoidea blandingii* (Figure 20). Pope (1939) lists the "northwestern tip of Pennsylvania" in the distribution of the Blanding's Turtle. While Netting (1946) stated that since Blanding's Turtle was common in the Great Lakes region, it may occur rarely in western Pennsylvania. Netting (1932) also hypothesized that Blanding's Turtle reached the Conneaut Lake area from Lake Erie via the Erie Extension Canal. The canal operated from 1844 to 1877, and emptied into the harbor at Presque Isle Bay west of the public dock (Brenner, 1967; Muller, 1991). To my knowledge the first map depicting Presque Isle specifically as a known locality for Blanding's Turtle was in McCoy (1973). The Blanding's Turtle was designated as rare and endangered in Pennsylvania in 1974, and given formal protection with a closed season (McCoy, 1975). Currently, Blanding's Turtle is listed as a candidate species in Pennsylvania (Pennsylvania Code, 2019). The Blanding's Turtle was selected by Steele et al. (2010) as a Species of Greatest Conservation Need because of the species' extremely restricted distribution and poorly understood status. McCoy (1990) recommended that Blanding's Turtle be regarded as extirpated in Pennsylvania pending discovery of a breeding population. Furthermore, the occasional turtles observed along the Pennsylvania Lake Erie shoreline, particularly at Presque Isle, have been considered waif individuals from other populations such as Long Point, Ontario or Ohio to the west (McCoy, 1982; Ernst, 1985; McCoy, 1986). McCoy et al. (1994) considered it possible that such waifs could become established on Presque Isle. Since 1983 eleven different individuals have been observed on the peninsula (Lethaby, 2019 personal communication), challenging the waif hypothesis. It remains uncertain if a viable population exists on the peninsula. If indeed there is a small population on Presque Isle, the heavy vehicular traffic that the park experiences during the nesting season may be holding the population to near extinction levels (McCoy, 1990; Hulse et al., 2001). More than 4.5 million people may visit Presque Isle State Park annually, more visitors than Yellowstone or Yosemite National Park (Ware, 2016).

On Long Point, Ontario, a sand spit with similar habitats and herpetofauna to Presque Isle, the Blanding's Turtle is relatively abundant (Logier, 1931; Adams and Clark, 1958).

Wood Turtle, *Glyptemys insculpta* (Figure 21). A Wood Turtle in the CM (CM-S 6880) was collected 28 August 1933 by S. H. Williams with the locality recorded as "near Erie, Presque Isle." Another specimen (CM-S 7503), also collected by Williams (in 1934), has the locality recorded as "Erie Harbor." McCoy (1982) included Presque Isle as a locality for the Wood Turtle based on one or both of these specimens. However, based on the ambiguous locality given for the specimen collected in 1934, I consider it possible that it was collected from one of the mainland streams emptying into Presque Isle Bay and not the peninsula. Wood Turtles are found in the vicinity of wooded streams with hard sand and gravelly bottoms, especially those with streamside openings in the canopy (Ernst and Lovich, 2009). Such habitat is lacking on Presque Isle, and it is doubtful that there ever was a viable population there. An alternative hypothesis for the occurrence of the Wood Turtle on Presque Isle is that the specimen(s) were released prior captives. There is a long history of pets being released on the peninsula (see Red-eared Sider account). By the time of Williams collection, several roads had been built on Presque Isle, resulting in previously unprecedented visitation rates on the peninsula and frequent traffic jams (Brandon, 1997; Ware, 2011; Ware, 2013). These roads would have made access to the interior of the peninsula for those bent on disposing of unwanted animals.

Northern Map Turtle, *Graptemys geographica* (Figure 22). The Northern Map Turtle was first documented from Presque Isle in 1816 by LeSueur (1817), and has long been known to be one of the most abundant turtles on the peninsula (Atkinson, 1901). Lindeman (2009) restricted the type locality of the Map Turtle to the peninsula of Presque Isle and adjacent Presque Isle Bay, Erie, Pennsylvania. Northern Map Turtles at Presque Isle have been shown to feed predominately on Trichopteran larvae, snails, and zebra and quagga mussels (*Dreissena* spp.), with large females feeding almost exclusively on *Dreissena* (Lindeman, 2006). Steele et al. (2010) chose the Northern Map Turtle as a Species of Greatest Conservation Need in Pennsylvania because of its restricted range, loss of habitat, relatively high mortality from motor vehicles, and its representation of the guild of species associated with riverine habitats. At Presque Isle the Northern Map Turtle appears to be secure. Mahoney and Lindeman (2016) reported that the Northern Map Turtle was the most abundant turtle captured during their 1999–2015 study.

Eastern Musk Turtle, *Sternotherus odoratus* (Figure 23). The Eastern Musk Turtle was first documented on Presque Isle by Daniel Atkinson, with a specimen (CM R3185) dated 7 June 1906. Like the Northern Map Turtle, Eastern Musk Turtles at Presque Isle prey heavily on the invasive zebra and quagga mussels (Patterson and Lindeman, 2009). The Eastern Musk Turtle was the third most abundant turtle observed by Mahoney and Lindeman (2016).

Woodland Box Turtle, *Terrapene c. carolina* (Figure 24). The Woodland Box Turtle was first documented from Presque Isle by Daniel Atkinson with a specimen (CM R3168) dated 7 June 1906. The Woodland Box Turtle was selected by Steele et al. (2010) as a Pennsylvania Species of Greatest Conservation Need, due to evidence of population declines, habitat loss, and high mortality among eggs and young turtles. The Woodland Box Turtle is likely extirpated from Erie County, including Presque Isle (Gray and Lethaby, 2008), or if present occurs in very small nonviable populations. Recent sightings of Woodland Box Turtles on Presque Isle likely represent released pets. The Woodland Box Turtle is popular with reptile hobbyists, and is frequently released in parks and nature centers when the owner decides they no longer wish to keep the animal (see below regarding the Red-eared Slider). Introduced specimens have been reported from other areas in the Great Lakes Region (King et al., 1997). Elsewhere in Erie County reports of Woodland Box Turtles have been attributed to the release of pet turtles (Gray, 2006).

Red-eared Slider, *Trachemys scripta elegans* (Figure 25). The first published record of the Red-eared Slider on Presque Isle was by McKinstry et al. (1987). Since that time, Red-eared Sliders have been observed at various locations on Presque Isle, including near the entrance to the park, Lily Pond, Duck Pond, the Waterworks ponds, and a wetland adjacent to Thompson Bay (Lethaby, 2019 personal communication; personal observation). The Red-eared Slider is considered one of the 100 worst invasive alien species by the International Union for the Conservation of Nature (IUCN) (Lowe et al., 2000). While impacts on native turtles in the Great Lakes region remain unclear (Spear et al., 2018), impacts have been observed in Europe. For example, in addition to possibly transmitting disease, Red-eared sliders out-compete native European Pond Turtles (*Emys orbicularis*) for food and basking sites (Polo-Cavia et al., 2010; Polo-Cavia et al., 2011). In mesocosm studies in France, European Pond Turtles displayed reduced fitness when Red-eared Sliders were introduced (Cadi and Joly, 2003, 2004), while in another study, Spanish Terrapins (*Mauremys leprosa*) avoided waters containing *T. s. elegans* chemical cues. The results of this latter experiment possibly explain the displacement of Spanish Terrapins by Red-eared Sliders throughout the Mediterranean region (Polo-Cavia et al., 2009). Pearson et al. (2015) hypothesize that growth of red-eared slider turtle populations will lead to population declines of native turtle species throughout their introduced ranges because they use limited food resources more efficiently for their growth and development than native species. Pennsylvania Sea Grant began a program of trapping and removal of Red-eared Sliders from aquatic habitats on Presque Isle in 2018. Effort is also being made to educate the public regarding the potential negative impacts released Red-eared Sliders may have on native turtle species. For ages, turtles have been kept as pets by hobbyists (Young, 1897; Osburn, 1914; Verrill, 1915), and there is a long history of former pets being released on Presque Isle (Brandon, 1997). A 7-foot python (supposedly *Python natalensis*) was found in the grass on Presque Isle 9 August 1901 (Moseley, 1901). Additionally, an Ornate Box Turtle (*T. ornata*) and a Spectacled Caiman (*Caiman crocodilus*) were found on Presque Isle (McKinstry et al., 1987). More recently, a River Cooter (*Pseudemys concinna*) was found in the waters of Presque Isle on 9 July 2019 during crayfish surveys (M. Lethaby, 2019 personal communication), and represents the first report of this species at the peninsula. If not already in place, perhaps the sale, barter, possession or transportation of Red-eared Sliders in Pennsylvania should be prohibited, as it is for other invasive species, such as Northern Snakehead (PFBC, 2019).

Snakes

Eastern Hog-nosed Snake, *Heterodon platirhinos* (Figure 26). The Eastern Hog-nosed Snake was first documented from Presque Isle in August 1900 by Daniel Atkinson with a specimen (CM 1519) deposited in the CM. Eastern Hog-nosed Snakes were once apparently abundant on Presque Isle's sandy beaches (McCoy and Bianculli, 1966; McCoy, 1985). However, by the 1970s they were no longer observed on the peninsula (McKinstry and Felege, 1974; McKinstry, 1975; McPherson, 1982; McKinstry et al., 1991). An anecdotal record exists for the Eastern Hog-nosed Snake on Presque Isle from the late 1950s (Stull, cited as a personal communication in McKinstry et al., 1991). A "puffy adder snake" from the peninsula kept by Loretta Brandon while living on Presque Isle during 1956–1963 was likely an Eastern Hog-nosed Snake (Brandon, 1997). The colloquial name puff adder was commonly applied to *Heterodon platirhinos* in the first half of the 20th century (Stejneger and Barbour, 1933; Wright and Wright, 1957). The harmless Hog-nosed Snake is frequently persecuted due to its characteristic hissing, striking, and neck-spreading behaviors, and superficial resemblance to a venomous snake. Netting (1946) suggested that the Eastern Hog-nosed Snake would likely be extirpated from Pennsylvania if the public could not desist from killing every specimen encountered. This is very likely what happened to the species on Presque Isle, where Hog-nosed Snakes have likely been extirpated. Eastern Hog-nosed Snakes are primarily diurnal (Ernst and Ernst, 2003; Gibbons, 2017), as are human visitors to the peninsula, thus increasing the likelihood of encounters between the two. The Eastern Hog-nosed Snake was selected as a Pennsylvania Species of Greatest Conservation Need because of its restricted habitat, limited distribution, and unknown status in Pennsylvania (Steele et al., 2010). Surveys for this species on Presque Isle should be done in areas where there is sandy, friable soil with an abundance of toads.

Eastern Milksnake, *Lampropeltis t. triangulum* (Figure 27).

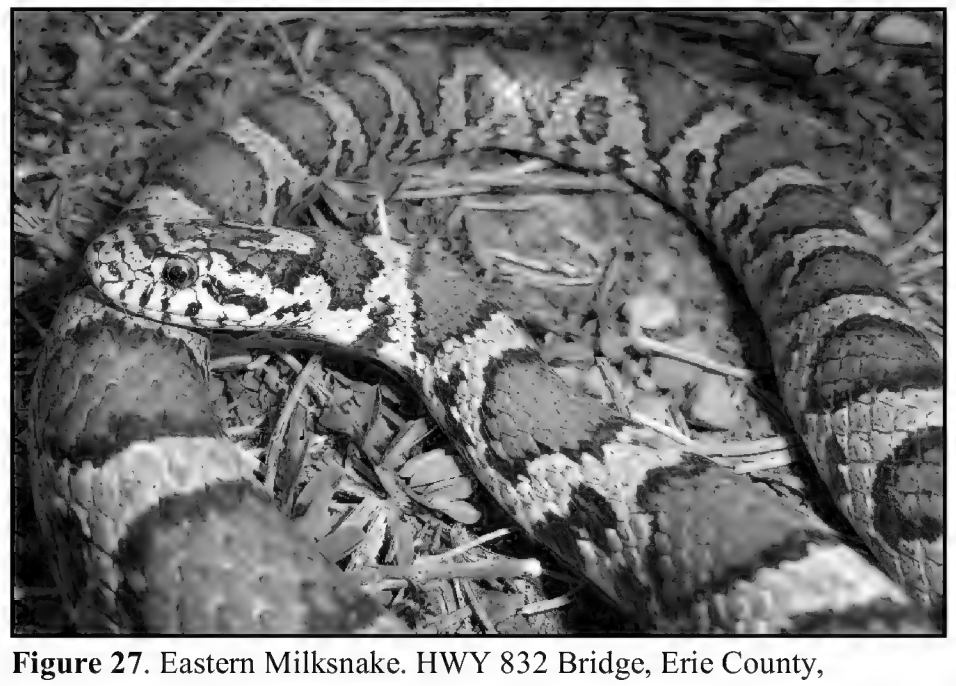

Figure 27. Eastern Milksnake. HWY 832 Bridge, Erie County, Pennsylvania. Photograph by Brian S. Gray.

Figure 28. Northern Watersnake. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Figure 29. Queensnake. Crawford County, Pennsylvania. Photograph by Brian S. Gray.

The Eastern Milk Snake was first documented on Presque Isle by Daniel Atkinson, with specimens (CM R467-471) deposited in the CM dated 5 June 1906. No other observations of Eastern Milksnake on Presque Isle are known (McKinstry et al., 1991). The Eastern Milksnake is relatively common at other sites in Erie County (Gray and Lethaby, 2008), and its apparent absence on Presque Isle is puzzling. Perhaps it suffered the same suspected fate as the Hog-nosed Snake. When cornered, an Eastern Milksnake may assume an S-shaped coil and repeatedly strike while vibrating its tail. In dry leaves the sound produced by the vibrating tail may resemble the "buzz" of a rattlesnake. Old unsubstantiated reports of Eastern Massasauga (*Sistrurus catenatus*) at the head (i.e., Massasauga Point) of the peninsula (Bates, 1884; Whitman, 1896) may have been the result of observations of Eastern Milksnakes displaying this behavior (Gray, in prep.). Eastern Milksnakes and Eastern Massasaugas also have similar blotched patterns. Certainly, there are no venomous snakes in Erie County today (Gray and Lethaby, 2008). Eastern Milksnakes are secretive, seldom seen in the open, and primarily nocturnal (Hulse et al., 2001; Ernst and Ernst, 2003), and therefore may not be observed as often as other snake species. Surveys for the Eastern Milksnake utilizing coverboards in open areas of fields with an abundance of small rodents and snakes is recommended.

Northern Watersnake, *Nerodia s. sipedon* (Figure 28). The Northern Watersnake was first documented on Presque Isle by Daniel Atkinson with numerous specimens collected in August 1900 and deposited in the CM. The Northern Watersnake, while infrequently observed on the peninsula (McKinstry et al., 1991), still occurs there.

Queensnake, *Regina septemvitatta* (Figure 29). The Queensnake was first documented from Presque Isle by Daniel Atkinson with a specimen deposited in CM (CM R-1936) dated 6 June 1906. The species was later observed by McPherson (1982) and possibly McAllister (1986, cited in McKinstry et al., 1987, based on unpublished field notes). The Queensnake is generally found in unpolluted streams with crayfish present (Ernst and Ernst, 2003). However, Queensnakes are also found in freshwater marshes, lakes, sloughs and bayous (Wright and Wright, 1957; Gibbons and Dorcas, 2004). For example, on Long Point, Ontario, Queensnakes are found in marsh habitat very similar to that on Presque Isle (Rowell, 2012; Ontario Nature, 2019). The following species of crayfish have been reported as prey of Queensnakes: Allegheny Crayfish (*Orconectes obscurus*), *O. juvenilis*, Rusty Crayfish (*O. rusticus*), *Procambarus* sp., and Devil Crayfish (*Cambarus diogenes*) (Ernst and Ernst, 2003; Gibbons and Dorcas, 2004). The Calico Crayfish (*Orconectes immunis*), Northern Clearwater Crayfish (*O. propinquus*), and the non-native Rusty Crayfish are recorded from waters of Presque Isle (Ortmann, 1906; Kormondy, 1969; Lethaby, 2019 personal communication), and could serve as prey for the Queensnake. The Queensnake was selected as a Pennsylvania Species of Greatest Conservation Need due to its limited distribution, poorly understood status, evidence of decline, vulnerability to water pollution, and the ongoing replacement of its native crayfish prey by more aggressive invasive crayfish (Steele et al., 2010). Surveys are needed to determine the status of the Queensnake on Presque Isle.

Northern Brownsnake, *Storeria d. dekayi* (Figure 30). The Northern Brownsnake was first documented from Presque Isle by Daniel Atkinson, with specimens deposited in CM dated August 1900. After the Eastern Gartersnake, the Northern Brownsnake is the second most common snake on the peninsula.

Short-headed Gartersnake, *Thamnophis brachystoma* (Figure 31). The Short-headed Gartersnake was first documented from Presque Isle with a specimen deposited in the CM by Thomas Cribbins in July 1976. Three Short-headed Gartersnakes were subsequently observed by McKinstry et al. (1991), two at the

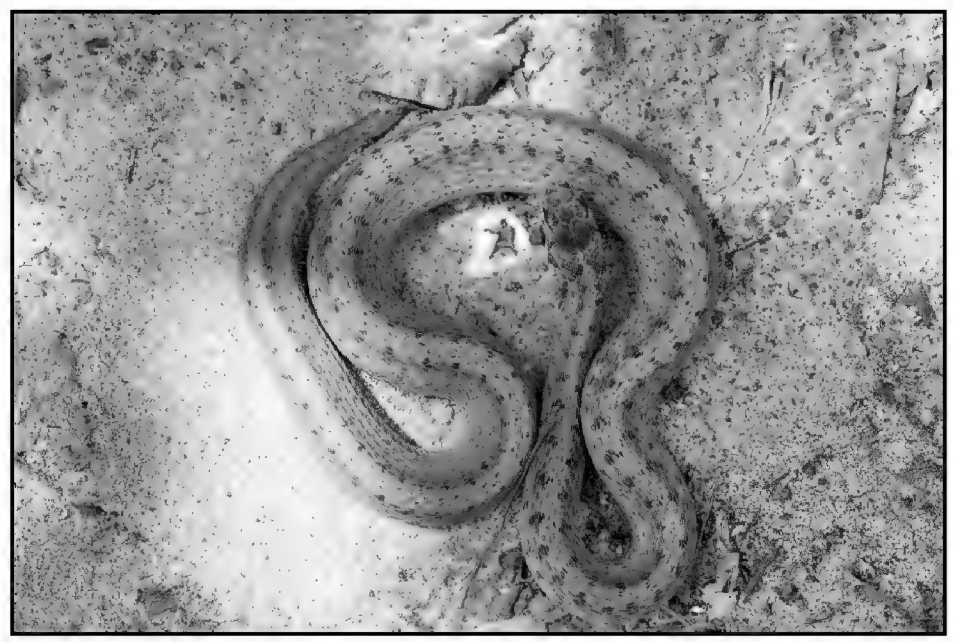

Figure 30. Northern Brownsnake. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Figure 31. Short-headed Gartersnake. Hwy 832 Bridge, Erie County, Pennsylvania. Photograph by Brian S. Gray.

dump site along Thompson Drive (i.e., Frye's Landing), and one between Dead Pond Trail and Niagara Pond. While the Short-headed Gartersnake may be established on the peninsula, it is not common there. Price (1978) regarded the Presque Isle record to be the result of human introduction. The Short-headed Gartersnake is primarily found in the eastern two-thirds of Erie County, and at a few sites is abundant (Gray and Lethaby, 2008; Lethaby and Gray, 2015). Steele et al. (2010) chose the Short-headed Gartersnake as a Pennsylvania Species of Greatest Conservation Need because of its uncertain status, limited distribution, and evidence of population declines. Furthermore, they noted that because more than 90% of its geographic range occurs within Pennsylvania, the commonwealth is the primary steward of the Short-headed Gartersnake (Jellen, 2010). Surveys with coverboards and drift fence arrays should be used to determine the status of the Short-headed Gartersnake on Presque Isle.

Northern Ribbonsnake, *T. sauritus septentrionalis* (Figure 32). The Northern Ribbonsnake was first documented from Presque Isle by Daniel Atkinson with specimens deposited in the CM dated August 1900. McPherson (1982) did not observe Northern Ribbonsnake during his survey, and erroneously reported that the species had not been found on the peninsula by McKinstry and Felege (1974), when in fact it had been. Six Northern Ribbonsnakes were also observed by McKinstry et al. (1991). Steele et al. (2010) chose the Northern Ribbonsnake as a Pennsylvania Species of Greatest Conservation Need because of its uncertain status, evidence of population decline, and specialized food and habitat requirements. The Northern Ribbonsnake is seen infrequently on the peninsula, and surveys should be done to determine the species' current status there.

Figure 32. Northern Ribbonsnake. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Eastern Gartersnake, *T. s. sirtalis* (Figure 33). The Eastern Gartersnake was first documented on Presque Isle by Daniel Atkinson, with specimens (CM 474-477) in CM dated August 1900. The Eastern Gartersnake is the most abundant snake on the peninsula (McKinstry, 1975; McPherson, 1982; McKinstry et al., 1991). Melanistic individuals (Figure 34) have been found on Presque Isle (McKinstry et al., 1990), and are relatively common at some localities in the Great Lakes region (King, 1988).

In summary, the unique herpetofauna of Presque Isle State Park has seen a significant decrease in species richness over the past century. Therefore, it is imperative that effort be made to conduct a multi-year survey of the peninsula's amphibians and reptiles, and identify those species most in need of conservation and management actions. The information furnished in this report offers a baseline for researchers interested in studying and conserving the herpetofauna of Presque Isle State Park, and should be valuable in the development of such long-term conservation and management plans.

Acknowledgments

I wish to offer my gratitude to the following individuals for their assistance with information regarding observations of amphibians and reptiles on the peninsula, granting permission to use their photographs, and or providing information regarding Presque Isle specimens in their respective collections: Charlie Eichelberger, Robert Grubbs, Lauren Kratzenberg, Mark Lethaby, Peter V. Lindeman (Edinboro University of Pennsylvania), Stephen Rogers (Carnegie Museum of Natural History), Steve Ropski (Gannon University), and Gregory J. Watkins-Colwell (Yale Peabody Museum of Natural History).

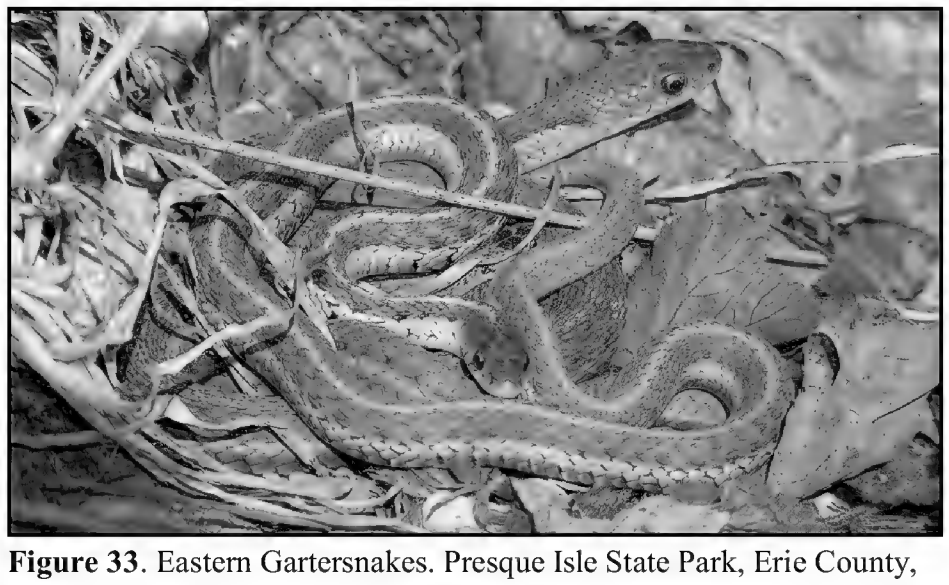

Figure 33. Eastern Gartersnakes. Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

Figure 34. Eastern Gartersnake (melanistic morph). Presque Isle State Park, Erie County, Pennsylvania. Photograph by Mark Lethaby.

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All sources cited in the text are included here. In addition, I have assembled a comprehensive bibliography on the herpetology of Presque Isle State Park, Erie, Pennsylvania. Titles preceded by an asterisk indicate that they are cited references that do not specifically mention Presque Isle amphibians or reptiles.

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Appendix

The following is a list of known amphibian and reptile specimens from Presque Isle, Erie, Pennsylvania. Museum abbreviations are as follows: CM = Carnegie Museum of Natural History, Pittsburgh, Pennsylvania; EUP = Edinboro University of Pennsylvania; FHSM = Fort Hays Sternberg Museum of Natural History, Hays, Kansas; MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; RM = Redpath Museum, McGill University, Montreal, Quebec; TREC = Natural History Museum at the Tom Ridge Environmental Center, Erie, Pennsylvania; USNM = United States National Museum, Washington, D. C.; YPM = Yale Peabody Museum of Natural History, New Haven, Connecticut.

Anaxyrus americanus: CM 2086, CM 2094, TREC-A 00034.
A. fowleri: CM 2084-2085, CM 2087, CM 2142-2143, CM 4489, CM 9966, CM 12221, CM 12270-12273, RM 4369-4381, RM 4383, RM 4385-4386, TREC-A 00009, TREC-A 00053, TREC-A 00060, TREC-A 00097, TREC-A 00131, TREC-A 00135-00137, TREC-A 00140, USNM 39841†.
Hyla versicolor: CM 119119, TREC-A 00093, TREC-A 00096.
Lithobates catesbeianus: TREC-A 00037-00038.
L. clamitans: CM 1861-1870, CM 1874-1878, CM 4490, TREC-A 00142.
L. palustris: CM 1739, CM 1743.
L. pipiens: CM 1740, CM 1803-1818, CM 2702-2705, CM 4491, CM 12222, CM 33630, TREC-A 00061.
L. sylvaticus: CM 1946.
Pseudacris crucifer: CM 1996, CM 2002, CM 5954, YPM HERA 001622.

Ambystoma maculatum: CM 1698, YPM HERA 000150, YPM HERA 000226-000229.
Gyrinophilus porphyriticus: CM 344.
Necturus maculosus: CM 35238, CM 37292, CM 41285, TREC-A 00059.
Notophthalmus viridescens: CM 1636, CM 1638, CM 4488.

Apalone spinifera: CM 1321, CM 3012, CM 3038, CM 3192, CM 3222, CM 43865, EUP 2-6, TREC-R 00101, TREC-R 00106, USNM 562752, YPM HERR 005931.
Chelydra serpentina: CM-R 3041, CM-R 3193, EUP 121, TREC-R 00042.
Chrysemys picta marginata: CM 3009-3011, CM 3039, CM 3151, CM 3175, CM 3218, CM 3221, CM-S 7508, CM-S 7482, CM-R 12318, CM-R 21741, CM-R 21742, CM-R 35137, TREC-R 00040, TREC-R 00041.
Clemmys guttata: CM-R 3204, TREC-R 00104, TREC-R 00153.
Emydoidea blandingii: TREC-R 00035, TREC-R 00061-00066, TREC-R 00070, TREC-R 00155-00156.
Glyptemys insculpta: CM-S 6880, CM-S 7503.
Graptemys geographica: CM-R 3006-3008, CM-R 3040, CM-R 3199, CM-R 3215, CM-S 7483, CM-S 58880, EUP 24-27, EUP 38-39, EUP 122-124, EUP 134, EUP 147, MCZ-R 54707, TREC-R 00037, TREC-R 00043, TREC-R 00044, TREC 00142, USNM 51192.
Sternotherus odoratus: CM-R 3185, CM-R 21740, EUP 112, EUP 148, TREC-R 00077.
Terrapene carolina: CM-R 3168.
Trachemys scripta elegans (introduced invasive species): TREC-R 00103.

Heterodon platirhinos: CM-R 472, CM-R 1980-1983, CM-R 1519, CM-R 2028, CM-R 2029, CM-S 6618.
Lampropeltis triangulum: CM-R 467-471.
Nerodia sipedon: CM-R 473, CM-R 1476-1484, CM-R 1506-1518, TREC-R 00036, TREC-R 00072, TREC-R 00102.
Regina septemvitatta: CM-R 1936.
Storeria dekayi: CM-R 1708-1737, CM-R 1902-1914, CM-R 51601, CM-S 4221, EUP 120, TREC-R 00113.
Thamnophis brachystoma: CM-R 61959.
T. sauritus septentrionalis: CM-R 478, CM-R 1432, CM-R 1485, CM-R 1500, CM-R 1915-1916, TREC-R 00011.
T. sirtalis: CM-R 474-477, CM-R 479-480, CM-R 1433, CM-R 1486-1499, CM-R 1501-1505, FHSM 10063, TREC-R 00129.

† The collection locality for USNM 39841 is given as Erie. Presque Isle is inferred as it is the only known locality for *A. fowleri* in Erie County.

USNM searched: <https://collections.nmnh.si.edu/search/herps/> (accessed 8 May 2019)

YPM searched: <http://peabody.yale.edu/collections> (accessed 7 June 2019)

Bulletin of the Chicago Herpetological Society 55(1):19-22, 2020

Turtle speak? An Unusual (Unique?) Display of Mass Social Interaction among Arizona Mud Turtles (*Kinosternon arizonense*) in Pima County, Arizona

Roger A. Repp
9044 N. Valgrind Lane
Tucson, AZ 85743
repproger22@gmail.com

This author has been retired now for approximately 100 Mondays. During this time period, I have already (sort of) forgotten how important vacation days were to me during my working career. While everybody else local generally used their vacation time to travel to other places, my own vacation days were reserved for herping in Arizona. Of course, when one is gambling precious days off for herping adventures, they can *not* be squandered. There were two "can't fail" times of the year when I knew the herpetological payoff would be worth the loss of precious vacation days. Hence, I *always* took some days off in early- to mid-March, and also, early- to mid-August. Then as now, March did not interest most out-of-town folk enough to join me. ("Gee, all we're going to see is *atrox* and Gila Monsters. I checked *those* off my life list years ago!") They miss the boat by this kind of behavior. However, August was—and still is—an entirely different matter. As anybody familiar with herping the Sonoran Desert knows, this is the number one month to give anything that you want to find a shot. August is the month that I get *very* popular, not only with people I know, but also with some I don't..

Back in August of 1998, when I still had over 1,000 Mondays left to survive before achieving that goal which I've now attained, I gambled four vacation days and a weekend to do something I had never done before. Until 1998, my vacation days in August were reserved for the higher elevation thrill snakes. We speak of Green Ratsnakes, Mountain Kingsnakes, Ridgenose and Rock Rattlesnakes—all the sort of thing that herpers visiting this state covet most. But this time, I was going to do something different. I would seek every species of turtle native to Arizona, all while in the company of a perfect stranger. It is well that noted turtle expert Jim Buskirk was indeed a "perfect stranger," for he stayed at my house while he visited, and we spent every waking moment together, seeking and talking about turtles. We had a blast!

We met on the internet. Jim was kind enough to mention something favorable about one of my articles that had appeared in the CHS *Bulletin*. We discussed many things in the days and months that followed the initial contact. When he mentioned his strong desire to check some of the turtle species in Arizona off his life list, I decided "Why not? Let's do this thing!" While I had already crossed paths with some of the species he mentioned, a Yellow Mud Turtle (*Kinosternon flavescens*) was also something that was on my own life list. We'd try to check that one off together, along with seeking everything else that he desired. We got them all, but it is now time to focus on that day of the Yellow Mud Turtle.

Before we go any further, I should explain that the turtles spoken of below, although considered Yellow Mud Turtles then, are no longer Yellow Mud Turtles. They are now called Arizona Mud Turtles (*Kinosternon arizonense*). Still, the true Yellow Mud Turtles are now on my life list. (I found scads of them in Texas a few years later.) One fine day, I'll go after the Arizona-based Yellow Mud Turtles and find one—before somebody changes *those* into something else. Taxonomists! If it were legal to do so, somebody would *surely* put a bounty on them. And basing a species on the size of a vertebral scute? Really?

On the morning of 17 August 1998 we topped a rise in the landscape—a place we had no business being—and beheld the pond for the first time. It was extremely beckoning in appearance, not one of those stinky, cattle-ravaged, slime-green, skuzzy little muck holes that often profane the valley floors in Arizona. Its mirror-like surface reflected the massive mesquite trees that flanked its shoreline, and there were verdant fields of tall grass enhancing the visual. As far as the eye could see, large, mature mesquite trees decorated the undulating prairie around it. In the distance, the rugged battlements of the outliers of the Coyote Mountains stood in stark contrast to that which was spread before us. Even though the elevation here was less than 2500 feet, the saguaros that were everywhere else in the distant vistas could not be found here. Perhaps the soil of the lush, surrounding grassland was too perfect for their seed to find purchase.

The pond was much larger than I had expected. It was almost a lake. It was longer than it was wide, perhaps 200 meters in length by 100 meters in width. As I was about to observe a man dive into it, I know it was deep enough to allow a diving herper to disappear beneath its surface, and not emerge with a head full of muck. Perhaps the generous rains that fell throughout 1998 had something to do with the vast size (for Arizona) and depth of it? I have never been back there again to compare how it might look in a drought year. In fact, I have never been back there again, period. The pond is located on the tribal lands of the Tohono O'odham nation. Going there is risky business, and there is no longer any need for me to do so. I saw more than I expected to see that day. Does the reader of this column wish to see an Arizona Mud Turtle? Follow in my footsteps at your own peril, lest you get gutted with a dull steer horn! The Tohono have no reason to love trespassers. (My job at Kitt Peak National Observatory, which was on tribal lands, allowed me some friendly interface with the locals. They told me of this pond, where to find it, and provided some names to use if questioned. (*There is no way in hell that I would have gone there without those names!*)

I am no longer much of an aquatic herpetologist. I moved to Arizona because I consider wading through ponds or streams a laborious process, and any boat that I am floating in will like as not vomit me into whatever water it floats upon. There is no webbing on my feet or hands. This herper belongs on dry land, and I could not have made a better choice as to where to spend the remaining days of my life. However, I *did* go after turtles

Figure 1. (Left) The author's best attempt at getting an Arizona Mud Turtle (*Kinosternon arizonense*) to pose for a "staged" picture. The bright yellow chin and throat on these turtles reminded the author of the Blanding's Turtles he used to find in his younger days. A color image of this species can be found on the website of the Tucson Herpetological Society. (Right) In-the-hand image shown for size perspective.

hundreds of times during my formative years in Northern Illinois, Arkansas and Florida. And I have learned enough from aquatic herpers to know the proper technique for approaching bodies of water on foot. As soon as we got our first look at this pond, we both had our binoculars out and on it. I have been taught to see the snout of a turtle or gartersnake cryptically hidden among lily pads or duckweed at great distances. There was nothing to be observed with the first look, and so we slowly pushed forward another ten meters or so, and tried again. And again. And again. It was a very patient and thorough approach. Eventually, and at length, we drew up to the shoreline of the pond. Once again, we glassed all aspects of the waters, and the shallows where water met land, in hopes of spotting one of our quarry. When nothing presented itself, we started to move together around it. Jim had one weapon in his skill set that I was unwilling to emulate. He stripped down to everything but his skivvies before he began his assault. I not only left all my clothes on, but immediately demonstrated that I wasn't a turtle guy at all by drifting into a mesquite bosque. I was hoping for a snake of some sort, but found something very different. A necklace, resplendent with turquoise and silver decorating it from end to end, was neatly laid out in a semicircle. Centered directly below the U-shape of the necklace was a petite pair of women's panties. While some might look at that as a trophy—a conquest of sorts—I looked at it as a strong statement of love. Although there was probably value in the necklace (it was an exquisite piece of work), I did not disturb it. The visual reminded me of younger days, and yes, I sighed as I turned away from it. It was a wonderful tribute to what had to be a splendid evening for two young lovers. The artful statement made me yearn for younger days then, as the remembrance of it does now.

I emerged from the trees just in time to watch Jim hastily step out of his underwear, and fling it backwards behind him, after which he initiated a perfect swan dive into the pond. It was like something out of the *Zorba the Greek* movie. One second, he was peacefully strolling slowly along the edge of the pond, and the next, he was ***all*** buns up and bonzai!—effortlessly parting the waters with a skillful dive. He went out of sight, and less than a second later, popped back up with a turtle in hand. *Just like that*—minutes after we arrived at this pond, our life list Arizona (Yellow) Mud Turtle was behind us. I, of course, applauded the effort, but I'm somewhat ashamed to say that I did so with my head turned away enough to not stare at the naked man who approached me with turtle in hand. I guess that true turtle people do this often (you guys sure know how to have fun), but it was a first for me. While a photograph of this tender moment could have happened, my camera remained in its pouch—where it belonged. (Although a photo of the dive would have been G-rated, and priceless!) I held the turtle, which was much larger than I expected it to be (the carapace was perhaps 175 mm [7 inches] long) while Jim got dressed again. And while the diving effort was commendable, we captured perhaps six others by the time we finished our loop around the pond. These were captured in shallow water, which at no point was any deeper than the top of my hiking boots. My notes indicate that we saw 15 of them this morning. But my notes do not indicate how many we actually captured. After we caught some, we let the rest swim away unmolested.

In any case, especially considering where they are found, this species of mud turtle is a very handsome beast. (One must keep in mind that the native aquatic turtles are pretty damn ugly in Arizona. And any turtle purist from Back East will rightly ridicule *any* outward beauty comparison of ours-to-theirs.) The yellow on the chin and neck is similar in color to that of a Blanding's Turtle, but it is here where any similarities between the two species end. The carapace is much flatter, and a dull brown in color (Figure 1). We of course took many photos of this first one, as well as most of the others that we captured. Jim managed to snag a pair of them together. As indicated in the literature, the male was larger than the female (Figure 2). They were all very shy during the photographic sessions, and remained mostly with heads inside shells. We did well to get what is shared here.

There was one other treat for us in store at this pond during the delightful two hours that followed. (My notes indicate that we were there from 1015 hours until 1205). When we got to the far side of the pond, along the length of a lush trickle of a feeder inlet, I found some smallish frogs hoping about. Upon stooping closer to investigate, I at first didn't know what they were. They were greenish-tan in base color, with some darker brown spots and blotches peppered about on the flanks, dorsum and head. They were all approximately 65 mm (2 inches) in length. The head on these little rascals was huge—impossibly large for them to be leopard frogs. Deep feats of thinking occurred. At one point, in those highly-charged days of unbridled enthusiasm for herping in Arizona, every common name and picture in my 1985 Stebbins field guide (which was all I had back then) had been burned into my brain. Most of the frog content had been forgotten, but suddenly the name "Casque-headed Frog" jumped into

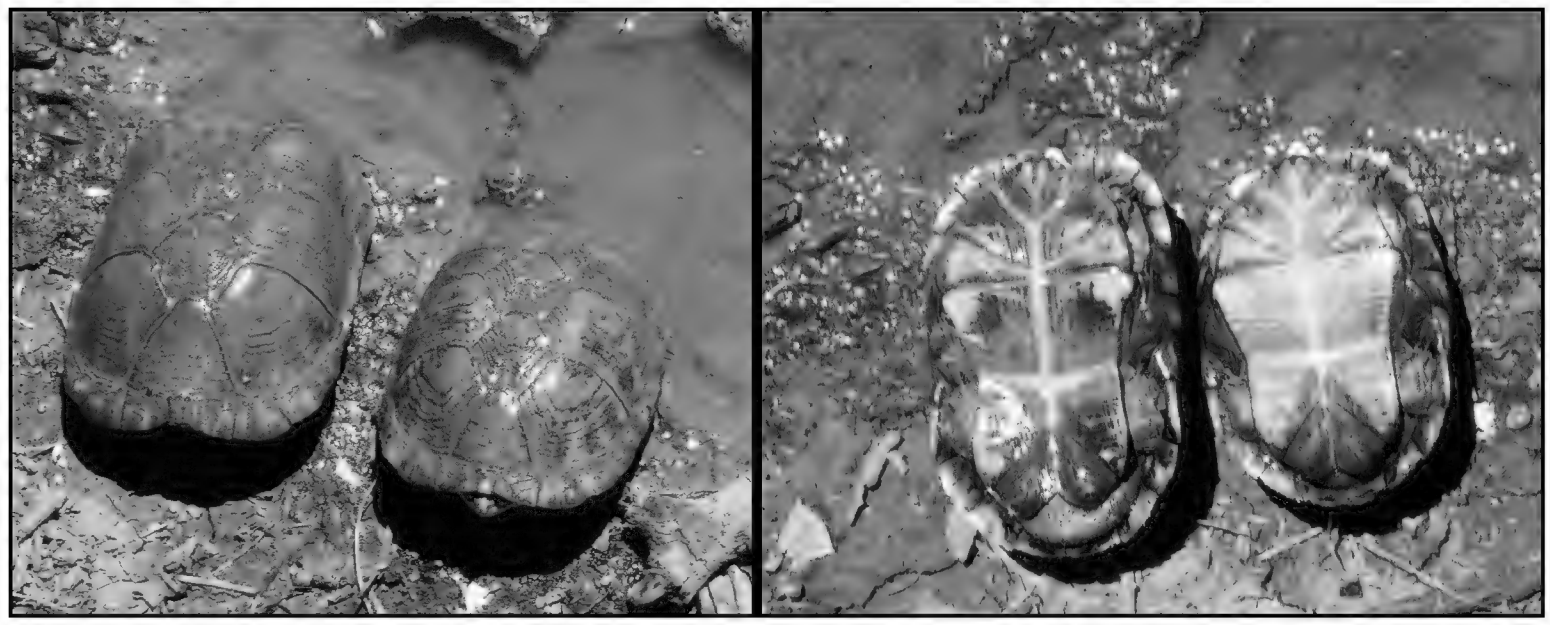

Figure 2. (Left) Carapace of male and female *Kinosternon arizonense*. (Right) Plastron of same. Note that the male, which is on the left in each image, is larger than the female.

my brain. There was no possibility at that time of the Latin nomenclature nomenclature doing a similar gymnastic leap into my frontal lobe. I did well to remember what I did. With the 1985 version of Stebbins, the Latin for these Casque-headed Frogs was *Pternohlya fodiens*. The whole name for this species of frog has since been changed to Northern Burrowing Frogs, *Smilisca fodiens* (Figure 3). The Stebbins common name for them leapt into my head in 1998, but the new name would have done nothing to help me identify them at the time. What was I saying earlier about taxonomists? Oh, never mind! Like the Arizona Mud Turtles, this day was the only time I have ever seen this cool species of frog. And even though 1998 was only ten years after I started taking herping in Arizona seriously, by that point in my life, I had checked off most of the life-list herps that can be found here. Those that remained on my life list then still remain now. In any case, finding two life-lister species in one morning was noteworthy.

But it was not until after we had completely circumnavigated the pond, and turned our back to it, that the *real* noteworthy event occurred. Jim was hiking at a normal walking pace, while I was lagging behind, checking the few boulder piles that could be found here. Hence, Jim got ahead of me, and had turned to face me while he waited for me to catch up. He was intently looking behind and beyond me. As I approached him, he flatly stated: "The word is out." As he said this, he jerked his head in the direction of the pond, which was to my back. I turned to see what he was talking about. When I did, I saw countless turtle heads protruding above the surface of the pond, looking right at us. Yes, the word was out indeed! When I say "countless," what I really mean is that I didn't count them. There were certainly at least 30, and probably more than that. I didn't think anything of it at the time. All I wanted to do was get back to the safety of my truck. The fact is, we were highly exposed to any eyes that might be observing the ridge where we stood, and I wanted us out of there before we had to attempt an explanation for why the naked guy and I had been ~~trespassing on~~ visiting tribal land. And as we both knew how *worthless* our cameras would be at that distance, we didn't bother with a photo. Sadly, I have nothing but words to describe the eerie sight of having a pond full of turtles staring straight at us.

Figure 3: A Northern Burrowing Frog (*Smilisca fodiens*). Four were found during the day described in the text. They were the first, and last, that this author has ever found. Image by Jim Rorabaugh.

The reader is invited to mentally compare the two very different glimpses of the pond described in this column. On our way to the pond—all the way to the shoreline, we did not see a single turtle. We approached that pond using every trick in our arsenal to get a visual. That effort did not pay off. And all the way around the perimeter of that pond, for the nearly two hours we were there, not a single turtle head was observed watching us. And several hands-on encounters occurred during that time. Whether captured and released, or simply observed, every turtle was viewed swimming away from us—from shallow to deeper waters. Every turtle was fleeing us, and not a one looked back, or popped up, to keep a watchful eye on us. But once we were leaving, perhaps 40 meters away, the whole pond seemed to be on a full state of chelonian alert. How did that happen? And why weren't they all hiding from us, instead of giving us a show of numbers? Was the whole population of this pond watching us as we left? This author thinks so. Did the first few turtles we captured swim around the pond hollering "The herpers are coming! The herpers are coming!" in turtle speak? Were they just curious, or wondering "what the hell was *that* about?" Or were they giving us the big "eff you" in turtle speak? I'm not putting anything past them.

I can't prove any of this communication-between-the-turtles stuff. Who could? When I write for the CHS *Bulletin*, I am well aware that many of you turtle people have forgotten more than I'll ever learn about them. Jim Buskirk's statement, "The word is out," seemed to indicate that he had seen this sort of thing before. In my experience, limited though it may be, I have *never* seen aquatic turtles do *anything* but swim and hide from me. One or two might pop up for a look see, but nothing like what we saw this day. I have my theories as to why this particular pond—the one and only stable water source for miles—might

harbor turtles that know each other very well. Some may spend as long as 20 years (or more) together, and the longer they associate with each other, the better the odds are of advanced social behaviors occurring. My experience with rattlesnake dens has led me to observe similar complex social behaviors, and yes, communication, among those snakes who inhabit the more isolated dens, (only one den for miles), in their range. The rattlesnakes in these isolated aggregations also seem to know each other very well. I'm certainly willing to give this population of Arizona Mud Turtles the benefit of any doubt with the statement "Turtles are just as smart as rattlesnakes." I'd *love* to hear from any turtle aficionado on the subject broached here.

This here is Roger Repp, signing off from Southern Arizona, where the turtles and snakes are smart, and the lizard people think lizards are smarter. How will we ever know *how smart* any of them are for sure?

Epilogue

Bears win! It has been my privilege to watch most of the 2019 Chicago Bears football season in the company of the Moll brothers, Ed and Don. Both are renowned Ph.D. turtle experts, each with decades of field experience with freshwater turtles the world over. On 29 December, we were thoroughly jazzed to watch our anemic, lackluster football team barely beat the second string of the Minnesota Vikings. A win is a win, and this last-game-of-the-season win propelled our win/loss record to a sizzling hot 8 and 8. During the course of one of the *copious* commercial breaks (that on occasion allow a football game to be glimpsed), I explained the event described above. I *knew* I had something when both admitted that they had never seen anything like it in their experiences at home and abroad. Don was polite about it, but I *really* knew I had something when Ed scoffed at the observation. In squinty-eyed and skeptical fashion, he gave me that big grin of his that often disguises anger, disgust, scorn or disbelief. Asked he: "And how many beers did you drink *before* you saw this happen?" In response, I informed him: "A better question might be how many bottles of tequila have I drained *since* this observation?" In any case, whenever a noted herp phud mocks an honest and earnestly-relayed observation, I think it's really cool!

References

Two brief but thorough accounts on the Arizona Mud Turtle, resplendent with color images and excellent natural history observations, can be found by simply typing "Arizona Mud Turtle" into your favorite search engine. Two standout websites will pop up in the field of choices. One is from the Tucson Herpetological Society, and the other link is simply reptilesofaz.org. Both authors, Jim Rorabaugh and Tom Brennan respectively, are to be commended for their efforts. And *do* take note of the wildly different shapes of the carapace, as well as the head coloration, with the color images in each.

Minutes of the CHS Board Meeting, December 13, 2019

Rich Crowley called the meeting to order at 7:35 P.M. Board members Dan Bavirsha, Cindy Steinle and Sammy Velazquez were absent. Minutes of the November 15 board meeting were read and accepted.

Officers' Reports

Treasurer: John Archer presented the financial reports for November. John asked that any incoming funds be given to Mike Dloogatch to deposit in our bank account.

Membership secretary: Mike Dloogatch read the list of expiring memberships.

Media secretary: Kim Klisiak has uploaded 30 years of CHS *Bulletin*s to the new website she is designing. She is looking for photos for the Herps of Illinois page. She will put together a how-to-manual to enable board members to update the site.

Sergeant-at-arms: Mike Scott reported 33 in attendance at the November 20 general meeting.

Committee Reports

ReptileFest: Frank Sladek reported that the cards to promote 'Fest are completed. Flyers will be printed soon. Sign-up on Eventbrite should be done by the end of the month. Frank hopes we can stuff flyers in the bags given out at NARBC. New venue is needed for the planning meeting. New volunteer coordinator is also needed. Frank hopes to line up back-ups for the bigger roles at 'Fest. He is putting together a master list of nature centers to find those who may take a table or loan animals for the Herps of Illinois display. He hopes to find a way to tie Earth Day into 'Fest. A Bug Corner is in the works this year.

Junior Herpers: the December Meeting was a holiday party featuring arts & crafts. A trivia game was awesome—kids really knew their stuff. Plans for 2020 include field trips, speakers, awards, holiday party, and 'Fest prep.

Adoptions: Zorina Banas discussed whether adoptions should be limted to members only, or whatever is in the best interest of the reptile. Her priority is making sure they are going to a proper home. She suggested making the adoption fee $25 for non-members, and it goes towards membership. If an adopter needs to rehome the animal, she will accept it without question. She is compiling a list of people willing to foster.

Grants: Mike Dloogatch reported only one proposal so far.

New Business

John Gutierrez will coordinate the December 18 holiday party.

There was discussion of forming a committee to suggest speakers.

The meeting adjourned at 10:00 P.M.

Respectfully submitted by recording secretary Gail Oomens

Chicago Herpetological Society
Income Statement: January 1 -- December 31, 2019

Income		Expense	
Membership dues	$ 10,066.40	Bulletin printing / mailing	12,568.26
ReptileFest	49,541.11	ReptileFest	39,080.87
Donations	7,374.60	Grants and donations	12,000.00
Bulletin ads	50.00	Rent (storage)	2,403.63
AmazonSmile	13.67	Bank / PayPal / Square fees	740.07
Interest	35.40	Junior Herpers	218.65
Raffle	488.00	Liability insurance	5,688.00
Merchandise sales	205.00	Dues, licenses and permits	1,164.70
		Postage	2,194.60
		Speaker reimbursement	2,229.17
		Library	303.00
		Awards	137.59
		Adoptions	16.72
Total Income	$67,774.18	Total Expense	$78,745.26

Net Income ($10,971.08)

Chicago Herpetological Society
Balance Sheet: December 31, 2019

Assets	
Checking	$ 4,287.91
Money market	34,468.54
Petty cash--show fund	196.00
PayPal	2,865.50
Postage on deposit	253.28
Total Assets	$42,071.23
Liabilities	
Credit card	211.43
Total liabilities	211.43
Equity	
Retained earnings	52,830.88
Net income	(10,971.08)
Total equity	$41,859.80
Total liabilities & equity	$42,071.23

Advertisements

For sale: **highest quality frozen rodents**. I have been raising rodents for over 30 years and can supply you with the highest quality mice available in the U.S. These are always exceptionally clean and healthy with no urine odor or mixed in bedding. I feed these to my own reptile collection exclusively and so make sure they are the best available. All rodents are produced from my personal breeding colony and are fed exceptional high protein, low fat rodent diets; no dog food is ever used. Additionally, all mice are flash frozen and are separate in the bag, not frozen together. I also have ultra low shipping prices to most areas of the U.S. and can beat others shipping prices considerably. I specialize in the smaller mice sizes and currently have the following four sizes available: Small pink mice (1 day old—1 gm) , $25 /100; Large pink mice (4 to 5 days old—2 to 3 gm), $27.50 /100; Small fuzzy mice (7 to 8 days old—5 to 6 gm), $30/100; Large fuzzy mice / hoppers (10 to 12 days old—8 to 10 gm), $35/100 Contact Kelly Haller at 785-224-7291 or by e-mail at kelhal56@hotmail.com

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to mdloogatch@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Micah Ashford
Kari Betton
Megan Colburn
Elena Garza
Colin M. Goodman
Leah Jacobs
Maryrose Mcgovern
Tanner Myers
Sara E. Parker
Christopher Puzek
Joseph Redinger
Siddhartha Regmi
Tristan Schramer
Courtney Silver-peavey
Geoff Smith
Jason Smith
Rachel Katharine Snyder
Sasha Tetzlaff
Bernardo Traversari
Rachel Utt
Joshua Vossler

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REPTITEMP® DIGITAL THERMOSTAT
Professional Series
Temperature Controller for Terrariums
MINI COMBO DEEP DOME DUAL LAMP FIXTURE
FOR UVB, 24 HOUR HEAT AND DAYLIGHT LAMPS
REPTISOIL
10 DRY QUARTS
NIGHTLIGHT RED Reptile Bulb
60w
100w
Repti Basking Spot Lamp
#1 Reptile Basking Spot Lamp
THE #1
REPTISUN 5.0 UVB
REPTISUN LED UVB 24" TERRARIUM HOOD
LED UVB+ LED HO HIGH-OUTPUT MODULES REPTISUN 5.0 T5HO UVB LAMP
TURTLETHERM
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GOURMET TORTOISE FOOD
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UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, January 29, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Michael Stefani**, proprietor of Mike's Monitors, will speak about "Captive Varanid Husbandry." Mike has kept and bred many reptiles over the years, and in 1998 he started working with monitor lizards. He was one of the first people to breed *Varanus jobiensis* in the U.S. Mike's program will be an in-depth summary of his experiences breeding and keeping a variety of varanid species over the past 20 years.

At the February 26 meeting **Michael Redmer** will speak about recovery efforts for the eastern massasauga rattlesnake throughout its range, and also present a brief, generalized history of that species in Illinois. Mike is a senior biologist for the U.S. Fish and Wildlife Service, and has been a CHS member since he was a teenager. He currently serves as the USFWS lead national biologist on the eastern massasauga.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

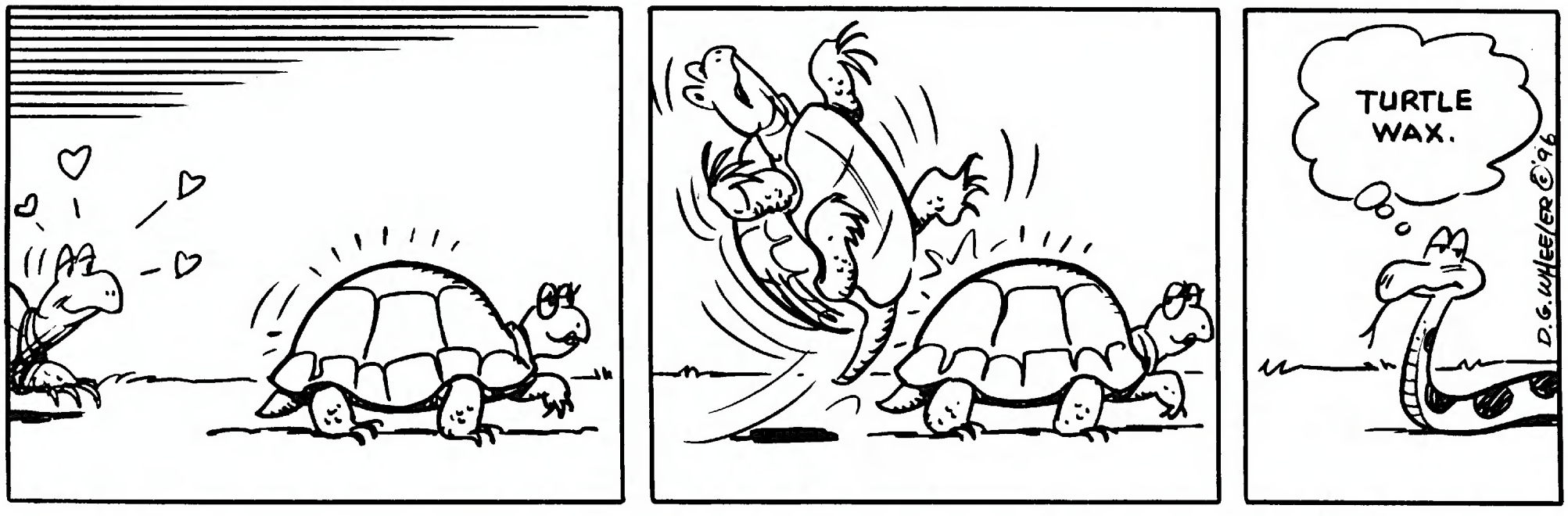
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to take place on February 14, 2020. If you wish to attend please email mdloogatch@chicagoherp.org.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the group's Facebook page.

THE ADVENTURES OF SPOT



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